

WHAT IS CLAIMED IS:

1. A positive electrode active material for a nonaqueous electrolyte secondary battery having at least a lithium-transition metal composite oxide of a layer structure,
in which an existence ratio of at least one selected from the group consisting of elements which may become tetravalent and magnesium is 20% or more on a surface of the lithium-transition metal composite oxide.
2. The positive electrode active material for a nonaqueous electrolyte secondary battery according to claim 1, in which said at least one selected from the group consisting of elements which may become tetravalent and magnesium is zirconium.
3. The positive electrode active material for a nonaqueous electrolyte secondary battery according to claim 1, in which said at least one selected from the group consisting of elements which may become tetravalent and magnesium is magnesium.
4. The positive electrode active material for a nonaqueous electrolyte secondary battery according to claim 1, in

which said at least one selected from the group consisting of elements which may become tetravalent and magnesium is titanium.

5. The positive electrode active material for a nonaqueous electrolyte secondary battery according to claim 1, in which said at least one selected from the group consisting of elements which may become tetravalent and magnesium are zirconium and magnesium.

6. A positive electrode active material for a nonaqueous electrolyte secondary battery having at least a lithium-transition metal composite oxide of a layer structure, in which the lithium-transition metal composite oxide is at least one selected from the group consisting of lithium nickel cobaltate, lithium nickel cobalt aluminate, and lithium nickel cobalt manganate having on at least a surface thereof at least one selected from the group consisting of zirconium and magnesium.

7. A positive electrode mixture containing the positive electrode active material for a nonaqueous electrolyte secondary battery according to claim 1 and a conductive agent, in which said at least one selected from the group

consisting of elements which may become tetravalent and magnesium exists between the positive electrode active material for a nonaqueous electrolyte secondary battery and the conductive agent.

8. A positive electrode mixture containing the positive electrode active material for a nonaqueous electrolyte secondary battery according to claim 2 and a conductive agent, in which said at least one selected from the group consisting of elements which may become tetravalent and magnesium exists between the positive electrode active material for a nonaqueous electrolyte secondary battery and the conductive agent.

9. A positive electrode mixture containing the positive electrode active material for a nonaqueous electrolyte secondary battery according to claim 3 and a conductive agent, in which said at least one selected from the group consisting of elements which may become tetravalent and magnesium exists between the positive electrode active material for a nonaqueous electrolyte secondary battery and the conductive agent.

10. A positive electrode mixture containing the positive

electrode active material for a nonaqueous electrolyte secondary battery according to claim 4 and a conductive agent, in which said at least one selected from the group consisting of elements which may become tetravalent and magnesium exists between the positive electrode active material for a nonaqueous electrolyte secondary battery and the conductive agent.

11. A positive electrode mixture containing the positive electrode active material for a nonaqueous electrolyte secondary battery according to claim 5 and a conductive agent, in which said at least one selected from the group consisting of elements which may become tetravalent and magnesium exists between the positive electrode active material for a nonaqueous electrolyte secondary battery and the conductive agent.

12. A positive electrode mixture containing the positive electrode active material for a nonaqueous electrolyte secondary battery according to claim 6 and a conductive agent, in which said at least one selected from the group consisting of elements which may become tetravalent and magnesium exists between the positive electrode active material for a nonaqueous electrolyte secondary battery and

the conductive agent.

13. A nonaqueous electrolyte secondary battery including:

a strip positive electrode constituted by forming, on at least one side of a strip positive electrode current collector, a positive electrode active material layer employing the positive electrode active material for a nonaqueous electrolyte secondary battery according to claim 1;

a strip negative electrode constituted by forming, on at least one side of a strip negative electrode current collector, a negative electrode active material layer employing, as a negative electrode active material, a lithium metal, a lithium alloy, a carbon material capable of intercalating and deintercalating lithium ions or a compound capable of intercalating and deintercalating lithium ions; and

a strip separator;

in which: the strip positive electrode and the strip negative electrode laminated with the strip separator between them are wound plural times to form a web of the strip positive electrode and the strip negative electrode with the strip separator intervening between them.

14. A nonaqueous electrolyte secondary battery including:

a strip positive electrode constituted by forming, on at least one side of a strip positive electrode current collector, a positive electrode active material layer employing the positive electrode active material for a nonaqueous electrolyte secondary battery according to claim 2;

a strip negative electrode constituted by forming, on at least one side of a strip negative electrode current collector, a negative electrode active material layer employing, as a negative electrode active material, a lithium metal, a lithium alloy, a carbon material capable of intercalating and deintercalating lithium ions or a compound capable of intercalating and deintercalating lithium ions; and

a strip separator;

in which: the strip positive electrode and the strip negative electrode laminated with the strip separator between them are wound plural times to form a web of the strip positive electrode and the strip negative electrode with the strip separator intervening between them.

15. A nonaqueous electrolyte secondary battery including:

a strip positive electrode constituted by forming, on

at least one side of a strip positive electrode current collector, a positive electrode active material layer employing the positive electrode active material for a nonaqueous electrolyte secondary battery according to claim 3;

a strip negative electrode constituted by forming, on at least one side of a strip negative electrode current collector, a negative electrode active material layer employing, as a negative electrode active material, a lithium metal, a lithium alloy, a carbon material capable of intercalating and deintercalating lithium ions or a compound capable of intercalating and deintercalating lithium ions; and

a strip separator;

in which: the strip positive electrode and the strip negative electrode laminated with the strip separator between them are wound plural times to form a web of the strip positive electrode and the strip negative electrode with the strip separator intervening between them.

16. A nonaqueous electrolyte secondary battery including:

a strip positive electrode constituted by forming, on at least one side of a strip positive electrode current collector, a positive electrode active material layer

employing the positive electrode active material for a nonaqueous electrolyte secondary battery according to claim 4;

a strip negative electrode constituted by forming, on at least one side of a strip negative electrode current collector, a negative electrode active material layer employing, as a negative electrode active material, a lithium metal, a lithium alloy, a carbon material capable of intercalating and deintercalating lithium ions or a compound capable of intercalating and deintercalating lithium ions; and

a strip separator;

in which: the strip positive electrode and the strip negative electrode laminated with the strip separator between them are wound plural times to form a web of the strip positive electrode and the strip negative electrode with the strip separator intervening between them.

17. A nonaqueous electrolyte secondary battery including:

a strip positive electrode constituted by forming, on at least one side of a strip positive electrode current collector, a positive electrode active material layer employing the positive electrode active material for a nonaqueous electrolyte secondary battery according to claim

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a strip negative electrode constituted by forming, on at least one side of a strip negative electrode current collector, a negative electrode active material layer employing, as a negative electrode active material, a lithium metal, a lithium alloy, a carbon material capable of intercalating and deintercalating lithium ions or a compound capable of intercalating and deintercalating lithium ions; and

a strip separator;

in which: the strip positive electrode and the strip negative electrode laminated with the strip separator between them are wound plural times to form a web of the strip positive electrode and the strip negative electrode with the strip separator intervening between them.

18. A nonaqueous electrolyte secondary battery including:

a strip positive electrode constituted by forming, on at least one side of a strip positive electrode current collector, a positive electrode active material layer employing the positive electrode active material for a nonaqueous electrolyte secondary battery according to claim

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a strip negative electrode constituted by forming, on

at least one side of a strip negative electrode current collector, a negative electrode active material layer employing, as a negative electrode active material, a lithium metal, a lithium alloy, a carbon material capable of intercalating and deintercalating lithium ions or a compound capable of intercalating and deintercalating lithium ions; and

a strip separator;

in which: the strip positive electrode and the strip negative electrode laminated with the strip separator between them are wound plural times to form a web of the strip positive electrode and the strip negative electrode with the strip separator intervening between them.